

### Remarks

Claims 1-9, 13-19, and 28-46, and 56-61 are pending in the application. Claims 10-12, 20-27, and 47-55 were withdrawn from consideration based on an election of species requirement. Applicant requests that these claims be rejoined to the application if generic claims are allowed. Claims 1-9, 13-19, 28-46, and 56-59 have been amended. New claim 60-61 have been added. No new matter has been added by virtue of this amendment. Reconsideration of the application as amended is requested.

### Claim Rejections--35 U.S.C. § 102(e) and 35 U.S.C. § 103(a)

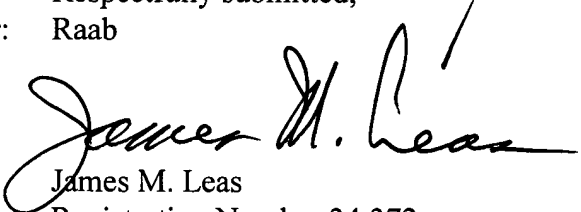
The Examiner rejects claim 1, 2, 4, 5, 13, 17, 34, 40-45, and 56-59 under 35 U.S.C. § 102(e), as being anticipated by Bartlett. The Examiner also rejects claims 3, 5-6, 8, 9, 14, 15, 16, 18, 19, 33, 37, and 38 under 35 U.S.C. § 103(a), as being unpatentable over Bartlett. However, as shown in the attached affidavits, Applicant conceived the invention and was diligent from a time before Bartlett's filing date to the date applicant filed his first provisional application for patent. Thus, Bartlett is removed as a reference. Therefore, the rejections have been traversed.

Applicant has reviewed the prior art made of record but not relied upon and has found that Sokal does not teach or suggest an electronically variable reactive element. All the variable capacitors in Sokal are mechanically variable.

It is believed that the claims are in condition for allowance. Therefore, applicant respectfully requests favorable reconsideration. If there are any questions please call applicant's attorney at 802 864-1575.

Respectfully submitted,

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**Version with markings to show changes made**

**IN THE CLAIMS:**

**Please amend the following claims:**

- 1 1. (Amended) An electronically tuned circuit [radio-frequency power amplifier],  
2 comprising[: (a)] a power amplifier coupled to an electronically tunable output  
3 network, said output network including an electronically tunable reactive component  
4 [having an amplifier input and an intermediate output, and (b) an output network  
5 coupled to said intermediate output of said power amplifier, said output network  
6 including a tuning input, a network output, and at least two reactive components  
7 connected as a tuned circuit, at least one of said at least two reactive components  
8 being adapted to being electronically tuned by a tuning signal applied to said tuning  
9 input].
- 1 2. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, wherein said output network is adapted to be tuned to a selected frequency.
- 1 3. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, wherein said output network is adapted to be adjusted to match a selected  
3 load impedance.
- 1 4. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, wherein said output network is adapted to produce a modulated signal at  
3 the network output.
- 1 5. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 4, wherein said output network is further adapted to provide a power-amplifier  
3 load-impedance locus that substantially maximizes power-amplifier efficiency.

- 4 6. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
5 claim 4, wherein said output network is further adapted to follow a substantially  
6 resistive power-amplifier impedance locus, thereby maintaining power-  
7 amplifier efficiency near maximum.
- 1 7. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, wherein said output network is adapted to be tuned in accordance with a  
3 predetermined set of tuning inputs.
- 1 8. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 7, wherein said tuning inputs are selected in accordance with a lookup table.
- 1 9. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, wherein said output network is adapted to be tuned in accordance with a  
3 predetermined lookup table of tuning inputs.
- 1 13. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, wherein said electronically tunable reactive component includes an  
3 electronically tunable capacitor [at least two reactive components include at least one  
4 capacitive component adapted to be electronically tuned in capacitance].
- 1 14. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 13, wherein said electronically tunable capacitor [at least one capacitive  
3 component] includes a transistor.
- 1 15. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 13, wherein said electronically tunable capacitor [at least one capacitive  
3 component] includes a diode.

- 1 16. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 13, wherein said electronically tunable capacitor [at least one capacitive  
3 component] includes a diode having a control terminal.
- 1 17. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 13, wherein said electronically tunable capacitor [at least one capacitive  
3 component] includes a micro electro-mechanical system device.
- 1 18. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 13, wherein said electronically tunable capacitor [at least one capacitive  
3 component] includes a variable-dielectric material.
- 1 19. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 13, wherein said electronically tunable capacitor [at least one capacitive  
3 component] includes a piezo-electric device.
- 1 28. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, further comprising a controller [with a controller input and controller  
3 output], said controller for providing a signal for controlling said electronically  
4 tunable output network [a conversion of frequency, impedance, and modulation  
5 inputs into tuning signals for control of said electronically tuned network].
- 1 29. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 28, further comprising an envelope detector with an envelope-detector input  
3 and envelope-detector output, said envelope-detector output coupled to the input of  
4 said controller, said envelope detector being responsive to an input RF signal and  
5 providing a modulation input to said controller.

1 30. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 28, further comprising a drive-level adjustor coupled for adjusting amplitude  
3 of a signal provided to said power amplifier [with an adjustor input and an adjustor  
4 output, said adjustor output coupled to the input of said RF power amplifier, said  
5 adjustor being responsive to an input RF signal and providing an RF-drive signal to  
6 the input of said RF power amplifier].

1 31. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim [28] 1, further comprising a digital signal processor coupled to said power  
3 amplifier and to said electronically tunable output network, said processor for  
4 providing a drive signal to said power amplifier and a tuning signal to said  
5 electronically tunable output network [with digital-signal processor outputs coupled  
6 to the inputs of said RF power amplifier and said controller, said digital signal  
7 processor for generating the an RF-drive signal to the RF power amplifier and  
8 modulation input to the controller].

1 32. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim [28] 31, further comprising a [digital signal processor with digital-signal  
3 processor outputs coupled to the inputs of said RF power amplifier and said  
4 electronically tuned network, said digital signal processor generating the RF-drive  
5 signal to the RF power amplifier and the tuning signals to the electronically tuned  
6 network] controller coupled to said digital signal processor and to said electronically  
7 tunable output network, wherein output of said digital signal processor is directed to  
8 said controller and wherein output of said controller is directed to said electronically  
9 tunable output network.

- 1 33. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, further comprising a drive-level adjustor coupled for adjusting amplitude of  
3 a signal provided to said power amplifier [for adjustment of the amplitude of the  
4 RF-drive input to said RF power amplifier].
- 1 34. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 33, wherein said electronically tunable output network and said [RF-]drive-  
3 level adjuster [amplitude] are adapted to produce a modulated signal [at the network  
4 output].
- 1 35. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 34, wherein said circuit is for providing a desired circuit output, wherein when  
3 said desired circuit output is above a threshold said electronically tunable output  
4 network is used to control amplitude and when said desired circuit output is below a  
5 threshold said drive level adjuster is used to control amplitude [and said RF-drive  
6 amplitude are further adapted so that the drive amplitude determines the amplitude of  
7 the network-output signal when the amplitude of said network-output signal is below  
8 a threshold, and said output network determines the amplitude of the network-output  
9 signal when the amplitude of said network-output signal is above a threshold].
- 1 36. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 33, further comprising a controller for converting a modulation input into  
3 tuning signals for control of said electronically tuned network.
- 1 37. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 1, further comprising a bias input for setting [the] bias level of said power  
3 amplifier.

- 1 38. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 37, wherein said bias level is adapted to the minimum level necessary to  
3 enable operation of the power amplifier, thereby reducing power consumption.
- 1 39. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 37, further comprising a controller for adjusting said [power-amplifier] bias  
3 level in response to frequency, impedance, and modulation inputs.
- 1 40. (Amended) An electronically tuned circuit [radio-frequency power amplifier],  
2 comprising:
- 3 (a) means for power amplifying [, said power-amplifying means having an  
4 amplifier input and an intermediate output,]; and  
5
- 6 (b) means for electronic tuning of said means for power amplifying  
7 coupled to said means for power amplifying [intermediate output and  
8 adapted for electronic tuning of said radio-frequency power amplifier  
9 for providing a tuned output].
- 1 41. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 40, wherein said means for power amplifying [power amplifier operating]  
3 operates in class E and said electronic-tuning means is capable of being tuned  
4 [adapted] to provide [the series and shunt reactances] a reactance for optimum  
5 class-E operation for a selected frequency.

1 42. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 40, wherein said means for power amplifying [power amplifier operating]  
3 operates in class E and said electronic-tuning means is capable of being tuned  
4 [adapted] to provide [the series and shunt reactances] a reactance for optimum  
5 class-E operation while delivering power to a selected load impedance.

1 43. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 40, wherein said means for power amplifying [power amplifier operating]  
3 operates in class E and said electronic-tuning means is capable of being tuned  
4 [adapted] to provide [the series and shunt reactances] a reactance for optimum  
5 class-E operation while simultaneously modulating the output of said  
6 electronic-tuning means.

1 44. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 40, wherein said means for power amplifying [power amplifier operating]  
3 operates in class E and [said] further [incorporating] comprising [one or more] a  
4 fixed reactance [tuning elements] for optimum class-E operation at a first frequency,  
5 wherein said electronic-tuning means is capable of being tuned [adapted] to provide  
6 [the amplifier] said power amplifying means with a load impedance for optimum  
7 class-E operation for a selected second frequency.



1 45. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 40, wherein said means for power amplifying [power amplifier operating]  
3 operates in class E and [said] further [incorporating] comprising [one or more] a  
4 fixed reactance [tuning elements] for optimum class-E operation [at] with a first  
5 [network-output] circuit load impedance, wherein said electronic-tuning means is  
6 capable of being tuned [adapted] to provide [the amplifier] said power amplifying  
7 means with a load impedance for optimum class-E operation [for] with a [selected]  
8 second [network-output] circuit load impedance different from said first circuit load  
9 impedance.

1 46. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 40, wherein said means for power amplifying [power amplifier operating]  
3 operates in class E and [said further incorporating one or more fixed tuning elements  
4 for optimum class-E operation at full output amplitude,] said electronic-tuning  
5 means is capable of being tuned [adapted] to provide [the amplifier] an [load]  
6 impedance for [efficient suboptimum] optimum class-E operation when the circuit is  
7 delivering a maximum output signal amplitude, and said electronic-tuning means is  
8 capable of being tuned to provide suboptimum class E operation when the circuit is  
9 delivering less than a maximum output signal amplitude [while simultaneously  
10 amplitude-modulating the signal at the network output].

1 56. (Amended) An electronically tuned circuit [radio-frequency power-amplifier system],  
2 comprising one or more power amplifiers, each of said [one or more] power  
3 amplifiers having an [intermediate output, and one or more] output  
4 [networks] network, said [one or more] output [networks] network including [one or  
5 more] a tuning [inputs] input, a network output, and [one or more] an electronically  
6 tunable reactive component [components being adapted to being electronically tuned  
7 by one or more tuning signals applied to said one or more tuning inputs].

1 57. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 56, wherein said output network is adapted to be tuned to a fixed or variable  
3 frequency.

1 58. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 56, wherein said output network is adapted to be adjusted to match a fixed or  
3 variable load impedance at [the] said network output.

1 59. (Amended) An electronically tuned circuit [radio-frequency power amplifier] as in  
2 claim 56, wherein said output network is adapted to produce a modulated signal at  
3 [the] said network output.